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EXAMINER
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 18

Application Number: 09/500,919
Filing Date: 02/09/00
Appellant(s): Grzyll

Warren A. Zitlau
For Appellant

EXAMINER'S ANSWER

This is in response to appellant's brief on appeal filed 11/13/01.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

*(3) **Status of Claims***

The statement of the status of the claims contained in the brief is correct.

*(4) **Status of Amendments After Final***

No amendment after final has been filed.

*(5) **Summary of Invention***

The summary of invention contained in the brief is correct.

*(6) **Issues***

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows: Contrary to applicant's assertion that the applied prior-art has no teaching, suggestion, or motivation to use mixtures of fire extinguishing agents as claimed by applicant is the actual disclosure of the applied prior-art as understood by one having ordinary skill in the art.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 27-29 and 31 (i.e. Group IV), claim 32 (i.e. Group V), and claim 30 (i.e. Group VI) do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

JP 5-42230 Ohmure et al. Published 23 Feb. 1993, as translated by, Rodger P. Lewis, in applicants' officially submitted English Language Translation of the said JP Patent.

Robin et al. U.S. Patent Number 5,117,917 filed 02 June 1992.

Pitts, William M. Et al., "Construction Of An Exploratory List Of Chemicals To Initiate The Search For Halon Alternatives", NIST Technical Note 1279, (August 1990), pp. 54-57 and 132-133.

Applicants' admission in the preliminary amendment filed in the Parent Application S.N. 08/895,687 and the Declaration filed under 37 CFR 1.132 on 10 Feb. 1998, in Parent Application S.N. 08/895,687, of the hazard ratings for octafluoro-2-butene and hexafluoropropene as published in literature such as Sax et al..

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 27-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over **JP Patent Number 5-42230** published 23 Feb. 1993, as translated by, Rodger P. Lewis, in applicants' officially submitted English Language Translation of the said JP Patent, JP is taken in view of the Article entitled: **"Construction Of An Exploratory List Of Chemicals To Initiate The Search For Halon Alternatives"**, to Pitts et al. (August 1990), and is further taken in view of **Robin et al.** U.S. Patent Number 5,117,917 and **optionally** in view (for all the claims) of applicants' admission, in the preliminary amendment filed in the Parent Application S.N. 08/895,687 and the Declaration filed under 37 CFR 1.132 on 10 Feb. 1998 in Parent Application S.N. 08/895,687, of the hazard ratings for octafluoro-2-butene and hexafluoropropene as published in literature such as Sax et al.

The English language Translation of JP Patent Number 05042230 directly discloses that effective non-ozone depleting fire-extinguishing agents can be selected from both saturated and unsaturated halogenated hydrocarbons. Saturated hydrocarbons containing 1 to 4 carbon atoms are directly disclosed. Given species of such saturated fluorinated hydrocarbons are tetrafluoromethane, heptafluoropropane, pentafluorocyclopropane and hexafluorocyclobutane. Unsaturated fluorinated hydrocarbons and **unsaturated fluorinated carbons** containing **3 or 4 carbon atoms** having at least one fluorine atom bonded to the one double bond are also directly

disclosed. Examples of such unsaturated fluorinated hydrocarbons and fluorinated carbons are **hexafluoroisobutene, $CH_2=C(CF_3)_2$, (i.e. HFC-1336)** and ***hexafluoropropene*, $CF_2=CFCF_3$, (i.e. FC-216)** *(i.e. perfluoropropene that falls within applicant's small generic class of unsaturated perfluorocarbon as set forth in claims 27-29 and 31-32)*, see page 5-6, and Table 1 on page 8 of the English language translation. JP also directly teaches using admixtures of different fire extinguishing agents, see pages 6-7, and Tables 1-3. **Finally, JP directly suggests the use of propellant gases, such as nitrogen gas and carbon dioxide, with the taught fire-extinguishing agents and/or mixtures, see page 7, section [0025].**

JP differs from applicants' invention in the following ways: 1) JP does not directly disclose applicants' particularly claimed unsaturated perfluorinated carbon fire-extinguishing species of **octafluoro-2-butene** *as only required by independent claim 30*, 2) JP does not directly teach (i.e. by way of a specific example) a fire-extinguishing composition comprising an admixture of an unsaturated fluorinated hydrocarbon or an unsaturated fluorinated carbon with conventional saturated fire-extinguishing agents, and 3) JP does not directly teach (i.e. by way of an example) applicants' particular claimed streaming method of use step.

Pitts et al. (i.e. Pitts) directly teaches **hexafluoropropene, $CF_2=CFCF_3$, (i.e. perfluoropropene CASN 116-15-4)**, and **octafluoro-2-butene (i.e. perfluorobutene-2 CASN 360-89-4)** as potentially effective fire-extinguishing agents, see TABLE 7 on page 56 and the disclosure on page 133 wherein **perfluorobutene-2** is assigned a low toxicity hazard rating

of 1. Also note that on page 132 Pitts et al teaches that **perfluoropropene** has a far higher toxicity rating of 3.

Robin et al. (i.e. Robin) teaches fire-extinguishing methods utilizing saturated C_2-C_4 perfluorocarbons as efficient non-ozone depleting fire extinguishing agents, used either alone or in combinations with other known fire extinguishing agents. Given examples of such compounds are octafluoropropane and decafluorobutane. The taught fire-extinguishing methods are total flooding and portable systems that may use inert gases as pressurizing agents (e.g. streaming methods), see the abstract, and column 2, line 1 to column 3, line 5.

Applicants' admission, in the preliminary amendment and the Declaration filed under 37 CFR 1.132 on 10 Feb. 1998 in Parent Application S.N. 08/895,687, of the hazard ratings for octafluoro-2-butene and hexafluoropropene as published in literature such as Sax et al is noted. In this said admission, applicants reveal that the 4-hour LC_{50} for hexafluoropropene is 1673 ppm for rats, and the 4-hour LC_{50} for octafluoro-2-butene is 6100 ppm for rats. As such, the 4-hour LC_{50} for hexafluoropropene is at least 3.6 times more toxic than the 4-hour LC_{50} is for octafluoro-2-butene.

It would have been obvious to one having ordinary skill in the art to use the disclosure of the JP especially in view of Pitts et al's disclosure to the potentially effective use of **perfluorobutene-2 (i.e octafluoro-2-butene CASN 360-89-4)** as a fire-extinguishing agents, see TABLE 7 on page 56 and page 133, as motivation to actually use applicants' claimed unsaturated

perfluorinated carbon species of **octafluoro-2-butene** as the fire-extinguishing agent of choice. *(Please Note: the species **octafluoro-2-butene** is only required for applicant's independent claim 30, but may also be used as the unsaturated perfluorinated carbon fire extinguishing agent in claims 27-29 and 31-32).* The use of **octafluoro-2-butene** as the fire-extinguishing agent of choice is not only an obvious species ***that falls within a very narrow generic disclosure of JP to the use of unsaturated fluorinated hydrocarbons and unsaturated fluorinated carbons containing 3 or 4 carbon atoms having at least one fluorine atom bonded to the one double bond,*** but is directly suggested by the secondary reference to Pitts et al.. Note that Pitts et al disclosure on page 133 that **perfluorobutene-2 (i.e. octafluoro-2-butene)** is assigned a low toxicity hazard rating of 1, whereas Pitts et al disclosure on page 132 that **perfluoropropene (i.e. hexafluoropropene)** has a higher toxicity rating of 3 is motivation to one having ordinary skill in the art to substitute **perfluorobutene-2 (i.e. octafluoro-2-butene)** for JP's directly taught **hexafluoropropene (i.e. perfluoropropene)** since such as substitution would result in a fire extinguishing composition that is less toxic. Furthermore, applicants' claimed **octafluoro-2-butene** is also deemed to be an obvious analog over JP's directly taught species of **hexafluoroisobutene, $CH_2=C(CF_3)_2$, (i.e. HFC-1336)** and **hexafluoropropene, $CF_2=CFCF_3$, (i.e. FC-216) = (i.e. perfluoropropene)** respectfully.

Furthermore, additional motivation is present to one having ordinary skill in the art to use **octafluoro-2-butene** as the fire extinguishing agent of choice. Such additional motivation is provided by applicants' admission, in the preliminary amendment and the Declaration filed

under 37 CFR 1.132, that the published literature discloses that the 4-hour LC_{50} for **hexafluoropropene** is 1673 ppm for rats, and the 4-hour LC_{50} for **octafluoro-2-butene** is 6100 ppm for rats. As such, the 4-hour LC_{50} for **hexafluoropropene** is at least 3.6 times more toxic than the 4-hour LC_{50} is for **octafluoro-2-butene**. From such data, one having ordinary skill in the art would be strongly motivated to choose **octafluoro-2-butene** over **hexafluoropropene** since **octafluoro-2-butene** is less toxic and would thus be safer when used around human beings.

Furthermore, it would also have been obvious to one having ordinary skill in the art to use the disclosure of JP as strong motivation to actually make admixtures of unsaturated perfluorinated carbons fire extinguishing agents, such as applicants' claimed **perfluoropropene** *(applicable to applicant's claims 27-29 and 31-32 only)* or **octafluoro-2-butene** *(applicable to all of applicant's claims 27-32)*, with conventional fire-extinguishing agents, such as octafluoropropane, because JP directly suggests such admixtures wherein the unsaturated perfluorinated species of **hexafluoropropene(FC-216) (i.e. perfluoropropene)** is admixed with conventional fire-extinguishing agents, such as octafluoropropane, see sections [0015] and [0016] on page 6 of the English language translation of the JP reference. Furthermore, the Robin patent provides additional motivation for such admixtures, since Robin teaches that using admixtures of conventional fire-extinguishing agents are well known in the art.

Furthermore, applicants' particularly claimed streaming method of fire extinguishing, as set forth in dependent claim 32 only, is deemed to be well within the skill of the ordinary artisan. Such a method is deemed to be obvious design modifications used to meet particular needs

and/or requirements. In any case, **the primary JP reference itself directly suggests the use of propellant gases, such as nitrogen gas and carbon dioxide, with the taught fire-extinguishing agents and/or mixtures, see page 7, section [0025].** The use of such propellant gases is well known in the art to be used in conjunction with portable systems that are applied to the fire as a stream. Finally, the secondary reference to Robin et al. clearly discloses that applicant's claimed fire extinguishing method of streaming is well known in the art wherein inert gasses are used as pressurizing agents in portable systems.

(11) Additional Examiner Remarks

The following examiner remarks are taken from the Examiner's Answer written in response to applicant's ***Appeal Brief found in the Parent Application S.N 08/895,687.*** These examiner remarks are repeated here because they are deemed to be highly relevant to applicant's pending claims.

"The examiner's position in regards to appellant's argument, found on pages 9-10 of the Brief, concerning their **Supplemental 37 CFR 1.132 Declaration filed 03 November 1998** is found below. The following examiner's comments were made in the final rejection mailed 12/10/98 as paper number 10 [in parent case S.N. 08/895,687] and are repeated here because they address two additional 37 CFR 1.132 Declarations that were filed by appellant's during the prosecution of the pending application.

Applicant's 37 CFR 1.132 Declaration filed 10/13/98 (e.g. 13 Oct. 1998), applicant's Supplemental Response filed 11/3/98 (e.g. 03 November 1998) and **Supplemental 37 CFR 1.132 Declaration filed 11/3/98 (e.g. 03 November 1998)**, have all been fully considered but are not deemed persuasive to put the case in condition for allowance for the reason given above. Additional comments are found below.

Applicant's **Supplemental 37 CFR 1.132 Declaration filed on 11/3/98 (e.g. 03 November 1998)** is deemed, by the examiner, to show that the cup burner flame extinguishing concentration (i.e. FEC) for applicant's claimed fire-extinguishing species of **octafluoro-2-butene** is indeed less (average FEC of 4.7 with a Std. Deviation of 0.447214) and hence is superior to the (FEC) amount for JP's **hexafluoropropene, (i.e. CF_2=$CFCF_3$)** (FEC of 6.1 Std. Dev. 0.447338) fire extinguishing agent. Nevertheless, such results are not deemed to be unexpected.

It would have been expected by one having ordinary skill in the art that **octafluoro-2-butene** because of its higher molecular weight would be required in a smaller concentration amount to extinguish a fire than **hexafluoropropene** because of **octafluoro-2-butene** greater known heat capacity, see Pitts et al's TABLE 7 on page 56 wherein the heat capacity of **octafluoro-2-butene** and **hexafluoropropene** are listed. Furthermore, Robin et al. U.S. Patent Number 5,117,917 teaches that flame extinguishing concentrations for the saturated analogs of **octafluoro-2-butene** and **hexafluoropropene** show a similar decrease in the flame extinguishing concentrations necessary to extinguish an n-heptane diffusion flame when using perfluorobutane

as compared to using perfluoropropane, see Example 1 Table 1 of Robin et al.. Also note that the Example 1 shows that perfluoroethane requires a greater flame extinguishing concentration then either perfluorobutane or perfluoropropane. As such, one having ordinary skill in the art would expect that the corresponding unsaturated **perfluoralkenes** would exhibit similar extinguishing behavior, namely the higher molecular weight perfluoroalkenes would be required in a lesser amount to extinguish the n-heptane diffusion flame then the lower molecular weight **perfluoroalkenes**. As such, applicants' showing is not deemed to be unexpected.

Finally, applicant's 37 CFR 1.132 Declaration filed **10/13/98** has been careful considered but is not deemed to be helpful at establishing either unexpected and/or superior results for applicant's claimed invention. The said Declaration compared applicant's claimed species of fire extinguishing agent **octafluoro-2-butene** against fluorinated ether type fire extinguishing agents in regards to a Cup Burner Test (FEC) and a Streaming Test known as the Minimum Application Density Test. The comparative showing is basically deemed to be irrelevant because it does not use the closest prior-art which is deemed to be the above applied prior-art to JP that teaches the use of **hexafluoropropene** as a fire extinguishing agent. It is axiomatic that an applicant relying on comparative tests to rebut a *prima facia* case of obviousness must compare the claimed invention, or at least the disclosed invention which is commensurate in scope with the claimed invention, to the **closest prior-art**, see In Re Johnson, 203 USPQ 1260, and In Re Merchant, 575 F.2d 865, 197 USPQ 785 (CCPA 1978)". ".

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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